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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

QI, ZHI QIANG

ART UNIT

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2871

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/796,746	Applicant(s) ISHIKAWA ET AL.	
	Examiner Mike Qi	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 and 32-36 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,7,9-11,14-16,18,19,28,30 and 32-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6,8,12,13,17,20-27,29,35 and 36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 12, 2007 has been entered.

Claim Objections

1. Claim 1 is objected to because of the following informalities: in claim 1, line 13, recitation "...in the backbone. . ." in which the backbone does not have any definition. The claim 1 should have the definition to describe the backbone. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 5-6, 8, 12-13, 17, 20-27, 29, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,504,603 (Winker et al) in view of US

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2004/0184150 A1 (Johnson et al) and further in view of US 5,929,946 (Sharp et al) and US 2004/0051831 A1 (Yu et al).

Regarding claims 1 and 2, the X-layer has a property of O-plate and the Z-layer has a property of negative C-plate with larger negative Δn_{th} than -0.005 according to the specification (see paragraph 0039 of the specification).

Winker teaches (col.4, line 2-col.5, line 65; Figs.1-2, 8) that a liquid crystal cell using one or more optical compensating elements (multilayer optical compensation film) comprising O-plate (X-layer) (positive birefringent material) (see col.7, line 58 – col.8, line 5) and negative C-plate (Z-layer) (see col.4, lines 39-58), and the O-plate has its optic axis tilted with respect to the plane of the multilayer compensation film (oblique angle with respect to the plane of the display, see col.7, lines 61-65).

Winker does not explicitly show the layer Z satisfies two relations:

$$1) |n_x - n_y| < 0.001;$$

$$2) \Delta n_{th} = n_z - (n_x + n_y)/2 < -0.005;$$

but it would have been obvious as the property of such amorphous polymer C-plate.

As evidence, **Johnson** teaches that in order to improve the viewing angle characteristics of the display using polymeric optical film as optical compensators (see paragraphs 0007, 0008), in which C-plate such as in Fig.1, $n_x = n_y$, so that $|n_x - n_y| = 0$ that would be less than 0.001 (see paragraph 0023); and an absolute value of an out-of-

plane retardation of 55nm or greater, and the layer has a thickness of 10 μ m to 50 μ m, (see paragraph 0011). Because the term "out-of-plane retardation" refers to the product of the birefringence (the difference of the index of refraction) times the thickness of the layer (see paragraph 0034), so that the out of-plane birefringence Δn_{th} would be the range of 0.0011 to 0.0055, and such negative value range would overlap the value less than -0.005.

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. (see MPEP 2144.05 I.)

Concerning the material of the polymer for the Z layer (negative C- plate), **Johnson** further teaches that any polymeric material capable possessing the optical properties as optical film (compensation film) and also forming a non-crystalline (amorphous polymer) (see paragraphs 0043-0047), and the polymer material such as using polycarbonate (see paragraph 0045), and using such compensation layers to improve the viewing angle characteristics of the display (see paragraphs 0007, 0008).

The material for such polymer using a vinyl, carbonyl, amide, imide, ester, aromatic, sulfone or azo group that is conventional. **Sharp** further teaches (col.10, lines 24-37) that polymer materials are useful in producing filters (optical films), including but not limited to, such as poly-vinyl alcohol, so that such material for the polymer containing in the backbone a vinyl is conventional.

According to the specification of this application, paragraph 0043, " Such polymers usually contain non-visible chromophore groups such as vinyl, carbonyl, amide, imide, ester, carbonate, sulfone, azo, and aromatic groups in the polymer backbone." . Therefore, such material for the polymers usually contain a vinyl, carbonyl, amide, imide, ester, carbonate, sulfone, azo, and aromatic groups in the polymer backbone, and that would be a conventional.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the multilayer compensation film of Winker with the teachings of using such C-plate having $n_x = n_y$ and having an out of-plane birefringence as taught by Johnson, since the skilled in the art would be motivated for improving the viewing angle characteristics of the display (see paragraphs 0007, 0008).

Winker, Johnson and Sharp teach the invention set forth above except for that the layer Z (C-plate) having a polymer with glass transition temperature above 180°C.

Yu teaches (paragraph 0102) that the retardation film (compensation film) is prepared from polymer at a temperature above the glass transition temperature, and the polymer should preferably be selected such that its glass transition or melting temperature is significantly higher than the operating temperature of the retarder, so as

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to leave a solid polymer, otherwise it would be melted; and such method and suitable material are known to those skilled in the art.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the multilayer compensation film of Winker and Johnson with the teachings of the polymer applied at a temperature above its glass transition temperature as taught by Yu, since the skilled in the art would be motivated for leave a solid polymer (see paragraph 0102).

Regarding claims 5 and 6, Winker teaches (Fig.1) that the tilt angle θ of the optic axis with respect to the x-y plane changes in the thickness direction, and the azimuthal angle ϕ of the optic axis would be constant (fixed) in the thickness direction.

Regarding claim 8, Winker teaches (Figs.2 and 8) that the layer X (O-plate) and the layer Z (C-plate) are disposed in a substrate (such as substrate 238).

Regarding claims 12-13,17 and 20, the compensation film having function for the molecular alignment that is the property of the compensation film, so that the Z layer (C-plate) functions as alignment layers, and X layer (O-plate) functions as alignment layers; such that the alignment layers disposed within the compensation film and also the alignment layer functions as barrier layer as protection of the liquid crystal (see Fig.8).

Regarding claims 27, 29 and 35, Winker teaches (col.4, lines 3-15, col.5, lines 3-25; Fig.2) that a display comprises a liquid crystal cell (226), at least one polarizing element (222), and at least one optical compensation film (250); and the liquid crystal cell (226) is Twisted Nematic mode cell; and the substrate (238) is glass.

Regarding claims 21-26 and 36, Winker, Johnson, Sharp and Yu teach the

invention set forth above except for the Z layer (C-plate) comprising a polymer having a certain thickness; and the material of the substrate such as using triacetylcellulose (TAC).

Johnson further teaches that the polymeric optical film can have a thickness such as 10 to 50 μ m, 15 to 40 μ m, 15 to 20 μ m and 1 to 5 μ m (see paragraphs 0054- 0056), and the out-of-plane (C-plate) (layer Z) having thickness such as 10 μ m (see paragraph 0011); and according to the birefringence, the skilled in the art would be able to find a reasonable thickness for the Z layer; and the TAC film are often used as the substrate as using the TAC film to provide an adequate level of adhesion (see paragraph 0097).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the multilayer compensation film of Winker, Johnson, Sharp and Yu with the teachings of the compensation film having certain thin thickness and using TAC as substrate as taught by Johnson, since the skilled in he art would be motivated for forming such optical compensation layers so as to improve the viewing angle characteristics of the display (paragraphs 0007-0008) and obtaining an adequate level of adhesion (paragraph 0097).

Response to Arguments

4. Applicant's arguments filed on April 12, 2007 have been fully considered but they are not persuasive.

In response to applicant's argument that the amended claim 1 defines patentable

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subject matter, it is respectfully pointed out that Johnson teaches any polymeric material capable possessing the optical properties as optical film (compensation film) and also forming a non-crystalline (amorphous polymer) (see paragraphs 0043-0047), and using such compensation layers to improve the viewing angle characteristics of the display (see paragraphs 0007, 0008), and the material for such polymer using a vinyl, carbonyl, amide, imide, ester, aromatic, sulfone or azo group that is conventional. Sharp further teaches (col.10, lines 24-37) that polymer materials are useful in producing filters (optical films), including but not limited to, such as poly-vinyl alcohol, so that such material for the polymer containing in the backbone a vinyl is conventional. According to the specification of this application, paragraph 0043, " Such polymers usually contain non-visible chromophore groups such as vinyl, carbonyl, amide, imide, ester, carbonate, sulfone, azo, and aromatic groups in the polymer backbone." . Therefore, such material for the polymers usually contain a vinyl, carbonyl, amide, imide, ester, carbonate, sulfone, azo, and aromatic groups in the polymer backbone, and that would be a conventional.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Mike Qi
Patent examiner
May 1, 2007